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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,916	06/25/2003	Patrick Knebel	10971390-3	1768
22879 7590 01/11/2007 HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400			EXAMINER MEONSKE, TONIA L	
			ART UNIT	PAPER NUMBER
			2181	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/11/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action/Summary

Application No.

10/602,916

Applicant(s)

KNEBEL ET AL.

Examiner

Tonia L. Meonske

Art Unit

2181

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-17 is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 18, 2006 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Panwar et al., US Patent 5,875,316 (herein referred to as Panwar), in view of Hull et al., US Patent 5,922,065 (herein referred to as Hull).

4. Referring to claim 1, Panwar has taught a method for implementing two types of architectures on a chip, comprising:

a. receiving an instruction from a fetch engine (Panwar, column 5, lines 59-60, figure 2, reference number 202),

Art Unit: 2181

- b. determining whether the instruction is a macroinstruction or a microinstruction (Panwar, column 7, line 61-column 8 line 2, figures 3 and 6, Where a complex instruction of Panwar is a macroinstruction as claimed and a non-complex instruction of Panwar is a microinstruction as claimed.),
- c. if the instruction is a macroinstruction,
 - i. sending the macroinstruction to an emulation engine (Panwar, column 7, line 67-column 8 line 2, Figure 3, Where at least elements 302 and 308 of Panwar comprise the claimed emulation engine.),
 - ii. decomposing the macroinstruction into one or more microinstructions (Panwar, column 10, lines 32-34, Complex instructions are broken down into sub-bundles of microinstructions.),
 - iii. formatting, by a bundler, the microinstructions into bundles as preferred by the native microarchitecture (Panwar, column 10, lines 34-36, Complex instructions are broken down into sub-bundles of microinstructions.),
 - iv. dispatching a bundle in parallel to an execution engine via a multiplexer (Panwar, column 10, lines 36-38, Figure 3, 306),
- d. if the instruction is a microinstruction,
 - i. dispatching the microinstruction to the execution engine via the multiplexer (Panwar, column 7, lines 65-67 and column 8, lines 15-17, Figures 2 and 3, element 306, Non-complex instructions are selected by

Art Unit: 2181

multiplexer 306 and passed through to the rename unit, element 204, for execution.).

ii. dispatching additional information to the execution engine (Panwar, column 10, line 55-column 11, line 10).

e. selecting either the microinstruction from the fetch engine or the bundle from the emulation engine, by using the multiplexer (Panwar, Figure 3, element 306, column 7, line 61-column 8, line 2, column 8, lines 15-17, the non-complex microinstruction is selected on 310 OR the sub-bundle is selected from 308.), and

f. dispatching the selected instruction to the execution engine (Panwar, Figures 2, 3 and 6, element 306, column 8, lines 15-17, column 10, lines 34-38, column 7, lines 65-67)

5. Panwar has not specifically taught dispatching additional information to the execution engine, wherein the additional information is contained in bits of the bundle otherwise not required for emulation of the macroinstruction. However, Hull has taught dispatching additional information to the execution engine, wherein the additional information is contained in bits of an instruction bundle otherwise not required for execution of the instruction bundle (Hull, abstract, Figures 3 and 4, column 2, lines 21-29; column 4, lines 20-32, Hull issues a template field with a bundle of instructions. The template field is not required for execution of the instructions. The template field maps the instructions in the slots to execution unit types in order to increase processor efficiency during execution time (Hull, column 2, lines 5-30).). Therefore it would have

Art Unit: 2181

been obvious to one of ordinary skill in the art at the time the invention was made to have the method of Panwar, include dispatching additional information (i.e. the templates of Hull) to the execution engine, wherein the additional information is contained in bits of the bundle otherwise not required for emulation of the macroinstruction, as taught by Hull, for the desirable purpose of increasing processor efficiency (Hull, column 2, lines 5-30).

6. Referring to claim 3, Panwar in combination with Hull have taught the method according to claim 1, as described above, and wherein the additional information includes control information from the emulation front end (Panwar, column 10, lines 57-60) that is sent using a memory, floating-point, integer ("MFI") template, wherein the MFI template specifies that the bundle includes a memory instruction in a first syllable, a floating point instruction in a second syllable, and an integer instruction in a third syllable (Hull, figures 2-4, template 6 of figure 4).

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Panwar et al., US Patent 5,875,316 (herein referred to as Panwar), in view of Hull et al., US Patent 5,922,065 (herein referred to as Hull), as applied to claim 1 above, and further in view of Nemirovsky et al., US Patent 6,105,125 (herein referred to as Nemirovsky), and Davidson et al., US Patent 5,613,117 (herein referred to as Davidson).

8. Referring to claim 4, Panwar and Hull have taught the method according to claim 1, as described above. They have not specifically taught wherein the additional information includes an immediate from an emulation front end that is sent by using a memory, long-immediate, integer ("MLI") template that is interpreted by the execution

Art Unit: 2181

engine differently, depending upon whether the execution engine is operating in native mode or emulation mode. However, Nemirovsky has taught dispatching an immediate, which is merely a part of the claimed additional information, from the emulation front end (Nemirovsky, column 3, lines 48-52). It would be obvious to one of ordinary skill in the art at the time of the invention to include an immediate value to the execution engine so that the execution unit would be able to correctly execute the instruction. If an instruction had an immediate value associated with it, that value would have been required for the proper result of the instruction. Allowing the immediate to have its own syllable, or template, would have made it easier for the decoder to recognize the immediate value and would have reduced the time required for decoding. Therefore, one of ordinary skill in the art at the time of the invention would have included this extra information in an immediate template to reduce decoding time and to get the proper results of instruction execution.

9. The combination of Panwar, Hull and Nemirovsky have not specifically taught wherein the immediate template is sent by using an MLI template that is interpreted by the execution engine differently, depending upon whether the execution engine is operating in a native mode or an emulation mode. Davidson has taught an immediate template, sent by using an MLI template, that is interpreted by the execution engine differently, depending upon what mode the execution engine is operating in Davidson, column 26, lines 14-28; The different interpreters interpret the same template in different ways, with each pass of the template using a different mode.). By allowing the same template to have been interpreted in different ways for different modes, the system

would have understood several different languages, one for each pass. It would have been obvious to one of ordinary skill in the art at the time of the invention to have the same template interpreted by two different modes, one being a native mode and one being an emulation mode, such that the template would have been interpreted in different ways. Emulation mode was used so that one processor could understand data or instructions in a different way than its normal execution so that the processor could execute a different type of architecture than originally designed. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to interpret the template differently for different modes, so that the system could have used and emulated several different computer languages, and therefore take advantage of previously written code that existed in numerous different languages.

Response to Arguments

10. Applicant's arguments filed September 18, 2006 have been fully considered but they are not persuasive.

11. On pages 8 and 10, Applicant argues in essence:

"There is no suggestion or teaching in Panwar that output multiplexer 306 selects between the non-complex instructions and the microinstructions from the expanded complex instructions. Rather, Panwar is utterly silent as to the operation of output multiplexer 306.

...

Since Panwar dispatches the non-complex instructions for execution before it expands the detected complex instructions, output multiplexer 306 cannot select between the non-complex instructions and the microinstructions from the expanded complex instructions."

However, claim 1 does not claim selecting "between the non-complex instructions and the microinstructions from the expanded complex instructions".

Instead Applicant has claimed selecting either the microinstruction from the fetch engine OR the bundle from the emulation engine, by using the multiplexer.

"Selecting either..." is much different than claiming "selecting between...".

Specifically claim 1 states "selecting either the microinstruction from the fetch engine or the bundle from the emulation engine, by using the multiplexer, and dispatching the selected microinstruction/bundle to the execution engine". Since the claim is in the alternative, when a multiplexer selects either a microinstruction from a fetch engine OR a bundle from an emulation engine, then the multiplexer reads on the claims. For example, in Panwar, when a non-complex instruction, or a microinstruction as claimed, is received from the fetch engine, the microinstruction is selected by the multiplexer 306 and dispatched to the execution engine (See Figure 3, element 306, Panwar, column 7, line 61-column 8, line 2, column 8, lines 15-17). Whereas, in a second example, when a complex instruction, or a macroinstruction as claimed, is received from the fetch engine, the macroinstruction is expanded into a sub-bundle of microinstructions by elements 302 and 308, which comprise the claimed emulation unit. The instructions in the sub-bundle are then selected from the emulation unit by the multiplexer 306 and dispatched to the execution engine (column 7, line 61-column 8, line 2, column 10, lines 32-37). So Panwar has in fact taught "selecting either the microinstruction from the fetch engine (in the first example described above) or the bundle from the emulation engine (in the second example described above), by using the multiplexer (Figure 3, element 306), and

dispatching the selected microinstruction/bundle to the execution engine" as claimed in claim 1. Therefore this argument is moot.

Allowable Subject Matter

12. Claims 5-17 are allowed.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tonia L. Meonske whose telephone number is (571) 272-4170. The examiner can normally be reached on Monday-Friday with first Friday's off.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz Fleming can be reached on (571) 272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TLM

TONIA L. MEONSKE
Tonia L. Meonske
January 4, 2007